700 MHZ transition for State agencies
Frequently Asked Questions

I am using a 700MHz radio; can I transmit and receive communications with StateComm?

Yes, StateComm dispatch consoles have been connected to the 700 Master Site.

Are State EMS frequencies (155.280 and 155.340) still going to exist when/if the state goes to 700 MHz?

There are no plans to eliminate the State EMS frequencies. The EMS frequencies will have to go narrow band by 2013.

Can StateComm "patch" my 700 MHz radio to a non 700 MHz radio?

Yes

Is there a timetable for going from analog to digital service? We know that there must be a transition from wide band to narrow band by Jan 1, 2013.

At present there is no firm or mandated time table for moving into digital service. The Federal Government has already mandated that any radios purchased with federal funds are to be P-25 (digital standard) capable. This means that most manufacturers are gearing up to produce these radios. Interoperability will be accomplished via digital systems. Without a policy statement in place for State agencies, it is strongly suggested that agencies begin purchasing P-25 *capable* radios in 2008. Since the cost difference in comparable radios is only $100-$200 it is recommended that any 2007 radios purchased should be P-25 *capable*. By 2009, there should be policy in place and market pressure where all new Public Safety radios are P-25.

Fiscal target years for the purchase of equipment are to be 2009, 2010, 2011, correct?

When referring to narrow-band, which is a firm requirement due to Federal regulation, all radios purchased from 1998 are able to be made narrow-band. Public Safety Communications (PSC) has been inventorying the portable, mobile and fixed units and has almost completed a very complex analysis of which radio needs what type of change. Any changes from this point forward must be narrow-band. There will be a special emphasis to replace 100% of the older radios in 2009-2011 with a final, last minute adjustment in 2012.

What is it, as a state agency, that we are expected to use and by when? Is it correct that there will be a $10,000 fine after January 1st, 2013, for use of wide band radios?

The Federal rules on Narrow-band are quite clear – 100% by January 1, 2013. At that point, any radio on the air in Wide-band mode may be fined. The fines can be significant. Given the lead time provided by the FCC, you can expect them to be serious and unforgiving. They are not expected to approach the maximum $10,000 per-incident fine unless an agency has been negligent. However, it will still be expensive. Therefore, by the summer of 2012, all State radios will be Narrow Band and operate Narrow Band. Departments that routinely interface with Federal agencies should be able to operate in P-25 digital mode before 2012. It should also be pointed out that some cities and counties in the state are preparing to activate P-25 digital communications as early as the summer of 2007. This means that, while interoperation is possible, State agencies who do not have active P-25 mobile radios in those areas will not hear any routine communications from the local agencies.

Cost of either digital radios and/or interface software?

The digital radios purchased for the agencies should be P-25 radios. PSC has developed a list of radios that they recommend and have the ability to service. The list is somewhat limited as these are radio systems and it is necessary for the safety of all field operators that we keep some commonality in products. Today an Analog ONLY, Public Safety grade portable radios costs about $700. A similar P-25 radio is priced around $800 to $850. As we move forward, this will likely get even closer. Moving to trunked and/or 700 MHz will change that.

Any software and interface solutions will be essentially custom made. They will have to take into account the equipment and configuration at each location. For dispatch centers wishing to interface to 700 MHz there are considerable up-front costs as well as monthly connectivity charges and annual manufacturer maintenance contracts.

Explain 700 MHZ digital signal and narrow band capability.

700 MHz is the approximate frequency range of the radio. Today we use VHF radios around 150 MHz and what we call UHF Radios (700 MHz is still UHF too) in the 450 MHz range. We also have one system in the 800 MHz range. The higher the frequency, the smaller the antenna needed and to some extent, the smaller the equipment in general. In order to get a license in 700 MHz Public Safety you must use a digital radio. To understand some of the difference in systems, your VHF and UHF radios are FM radios much like a car stereo. The digital radios put out audio in a fashion similar to a CD or DVD. That is a part of the reason the digital can sound better. There are some trade off's – there is no such thing as a free lunch in radio either. With a digital radio, you either get very clear reception or no reception. With analog, you know you are getting near the end of the signal range when things sound "scratchy". This takes quite a bit of distance and can be best perceived in a fast car. Digital gives only a few feet between perfect and nothing. In that few feet, sound

breaks and gets choppy. You can easily experience this on foot, and in a car you may be well past the drop-point before you know it.

Narrow band refers to how much space in the radio spectrum a signal occupies. The figures are 25 KHz wide for wide-band, 12.5 KHz for narrow band today and a pending rule to change that to 6.25 KHz scheduled for 2016. That rule to change from 12.5 to 6.25 is set to take effect in 700 MHz first. While the date may flex to some extent, it is most likely that it will happen. There is no special magic or behind-the-scenes knowledge in this, but expect that the 6.25 standard will come about. In the meantime, we know that all wide band radios will have to be turned off by midnight, December 31, 2012. In between, when a narrow band radio owner files a complaint with the FCC that they are being interfered with by a wide band user, the wide band user must stop transmissions. That rule is in effect today.

At the same time all this is happening, the FCC has instituted what it calls "Safe Harbor" rules to try to cut down on or eliminate interference. In doing so, many new or renewed licenses must use lower power than previous licenses. This again limits the range of the radio. Being narrow band by itself does not significantly impact the range. The narrow band vs. wide band difference in sound is essentially an audio issue and can be fixed internally to the radio. Lower power out does affect the range.

How will this affect repeaters and their requirements?

Any new repeater absolutely must be narrow band and in many cases PSC must modify the license. PSC is only authorizing repeaters that either have installed or may be upgraded to P-25. These radios have a 15 to 20 year life span and to not use P-25 is to ask to do it over in a few years. Again, the cost difference in a repeater that has the capability of being modified vs. one that is analog only is not significant.

Are there federal or state dollars to help with this changeover?

There are grant programs available for almost any Public Safety agency. Be aware that you should be purchasing P-25 radios with any of this money. Look to the various professional organizations (PSIC, APCO, Chiefs of Police, Fire Chiefs, etc.) and BHS Area Field Officers for help in locating and applying for these funds.

Must all analog equipment be discarded or will there be hardware and software to interface with newer equipment? If so, for how long?

There will be various add-ons and interfaces for many years to come. Some of these will most likely be inappropriate. Others may be extremely helpful. There are some available today that could be described as for sale, but not quite perfect yet. It is likely that there will be a need to interface to analog equipment for close to the next 25 years. PSC is actively researching methods. We know that State systems will need to interface to older county, city and possibly some private systems that are not planning to go digital in the near future. There are some reasonable options today. They are very expensive and still in their

infancy. PSC would like to see more stable products before going on-line in a life-safety system.

This was to be implemented by regions. What regions are to be among the first to have these changes? And, is there a priority among state agencies for these guidelines?

Under the current state statutes there really is no single Idaho Radio system. Most agencies operate and pay for their own. PSC purchases and maintains those systems. They would like to work by region and discipline to coordinate repeater changes. Since we have over 100 remote locations, it would be cost-effective to change all radios needing change at any site and not have to make multiple site visits. They know as a practical matter that they cannot do this 100% of the time, but with advance notice and planning they hope to keep it close.

As mentioned above, PSC is inventorying and analyzing what is in place today. PSC would like to start in the Boise area and work out from there. Changing the repeaters is the first step. PSC must have the repeaters in place to effectively change subscriber units. From their inventory, they have some 9000 radios in the State system. More than half are at least narrow-band ready. The plan today is to get all remote sites capable of doing narrow band, then group-by group quickly change settings on radios for end-users, finally returning to the remote sites to enable the narrow band settings.

Priority will have to go to those able to handle the change the earliest. Since we do have so many radios, they must address those best able to make the change. In any event, starting in 2009 every agency should be looking at replacing 1/3 of those subscriber units they are identifying as incapable of narrow band, as well as affected base and repeaters. This will continue for 3 years.

Television broadcasts have had a timetable assigned and yet it keeps changing. Will this be the case for these guidelines? It would be fiscally irresponsible to ask for monies and find out it could have waited.

Narrow band is here. It is already being deployed in some parts of Idaho. If a wide band radio causes interference it must shut down. This is happening today, not 2013. PSC states that these are now rules and we cannot wait. It would be far more irresponsible to have a system be shut down unexpectedly. It is also fiscally unacceptable to pay fines for something we know about and can avoid.

"What is the State doing about 700 MHz?"

As noted earlier, there is no single State radio system at this time. With a few exceptions, each agency works with PSC to develop and purchase the system they need and can afford. PSC works to hold costs down by establishing a common set of equipment – which also aids the ability of agencies to communicate with each other – and providing in-house service at a fraction of the cost of external or individual agency service.

Having considerable experience with trunked radio systems, PSC can safely say that moving to the 700 MHz trunked radio environment would be a great benefit to the State as a whole and the individual agencies. The end user would have an easier time traversing their work region and at the same time have more individualized talk groups at their disposal. With a well designed system, more people could talk on a smaller overall number of remote sites and better coverage could be realized.

Why 700 MHz?

Because it is a "Greenfield". In no other frequency block could we optimize the coverage, channels, and capabilities without wreaking total havoc on all users. Next, because this band offers some of the best coverage, quietest spectrum available. It is similar to 800 MHz, but with no occupants. It will be 100% Public Safety with no commercial interference.

Why don't we already have it in operation?

Multiple reasons. First and foremost is money. To implement this for any one of the 5 major radio users, we are looking at overhauling over 60 current locations. Many of them (about 1/3) are solar powered and don't have the current to handle the new load. Next, as noted before there is no single radio system today. We would have to spend about 90% of the cost of changing everybody to change just one major agency. We need to be in a position to migrate at least the major system users as a block. At that point the system could accommodate the needs of most who desire to be on 700 MHz.

Another significant reason is that we need a full study of the user agency needs, including coverage and inter-agency operations. This must be followed by a true engineering plan that develops each site in the best way for all users. And we are back to money, as these planning efforts require external consultants and engineers.

So what *are* we doing?

PSC is upgrading as many of our remote sites as the State budget and funds will allow. They have worked with Public Works in the 2006 FY to correct problems at 3 sites, 5 more are on the table for 2007 FY and 5 more in 2008 FY. Both ISP and EMS dispatch consoles have been connected to the 700 MHz Master Switch. This will allow a reasonable level of interoperability with those local agencies already on 700 MHz. They are also developing plans to take to those who use the PSC 800 MHz system to change that system over to 700 MHz, giving us internal experience with a smaller sub-set of the equipment while we try to move forward on the larger, State-wide system, at the same time replacing an outdated and somewhat expensive to repair system.

State agencies referred in this document are:
Idaho Transportation Department
EMS/StateComm
Dept of Lands
Dept of Corrections
Idaho State Police
Boise State University